ATTACHMENT 2

DECLARATION OF JEFF M. McDOUGALL

I, Jeff M. McDougall, hereby declare as follows:

I. Introduction and Overview

1. My name is Jeff M. McDougall. The purpose of this declaration is for me to opine on the technical feasibility of Verizon Wireless to comply with the existing Federal Communications Commission ("FCC" or "Commission") Enhanced 9-1-1 (E9-1-1) location accuracy requirements for Phase II handset-based solutions, 47 C.F.R. § 20.18(h)(2), at test areas defined by Public Service Answering Point (PSAP) boundaries. I have direct and personal knowledge of the E9-1-1 Phase II technologies deployed by Verizon Wireless and can provide an assessment based on that knowledge.

2. I have reviewed Verizon Wireless's Comments on Part A of the Commission's Notice of Proposed Rulemaking in PS Docket No. 07-114 ("Notice") and I agree with Verizon Wireless's determination that, given current technologies, it is technically infeasible for Verizon Wireless to comply with the existing FCC accuracy requirements at test areas defined by PSAP boundaries throughout all PSAP jurisdictions in which it provides service. Specifically, I believe that there exist a substantial number of PSAP service areas where Verizon Wireless can and does provide exceedingly accurate E9-1-1 location estimates on a per call basis, but nevertheless will be technically unable to comply with existing FCC accuracy

requirements. I have worked on and supervised the testing of the E9-1-1 Phase II solutions deployed within the Verizon Wireless network and therefore, I support the Comments of Verizon Wireless filed in Part A of the above-captioned proceeding.

II. Qualifications

3. I am a former visiting Assistant Professor of Electrical Engineering at the Texas A&M University ("Texas A&M") in College Station, Texas. I am also the founder of two consulting companies, TELWORKS and PivotPoint Solutions LLC, through which I have worked with wireless companies on testing, monitoring and improving the accuracy of their E9-1-1 Phase II location solutions. I received both a B.S. and Ph.D. degree from Texas A&M University in May 1997 and August 2003 respectively, and an M.S. from Johns Hopkins University in May 1999, all in Electrical Engineering. As part of my Ph.D. course work, I studied statistical communication theory. My areas of expertise include E9-1-1 accuracy assurance testing and predictive modeling, low complexity channel models for packet data networks, wireless network infrastructure assessment and telecommunications generally.

4. Before my previous position with the Electrical Engineering Department of Texas A&M, I spent three years in academia as both a research engineer and lecturer. In addition, I have accumulated over five years of experience working with both industry (Motorola, Marconi, Cisco, 3M, Schlumberger, Lockheed Martin and Boeing) and research laboratories (Applied Physics Laboratories Johns Hopkins University and Southwest Research Institute). During my time with the Hopkins

laboratory, I worked on Global Positioning System ("GPS") signal acquisition in unique environments and RF range testing. In addition, I have conducted significant E9-1-1 accuracy assessments for various clients of my consulting companies, including Verizon Wireless. In that capacity, I have developed and implemented normalization techniques for aggregating empirical-based test measurements across various locations and designed methods of procedure ("MOP") for empirical-based accuracy testing.

III. It Is Not Technically Feasible For The AGPS E9-1-1 Location Technology To Meet The FCC's Accuracy Standards At The PSAP Level.

5. Verizon Wireless has widely deployed a server-assisted GPS location technology developed by Qualcomm called gpsOne®. This technology is very broadly deployed[1] and provides a hybrid approach to location finding with a coarse location estimate through Advanced Forward Link Trilateration ("AFLT") and a fine location estimate through GPS. Using gpsOne, Verizon Wireless has coupled a handset based GPS approach with a network-based approach employing the Time Difference of Arrival ("TDOA") location technique. Verizon Wireless's ability to meet the Commission's accuracy rules for handset-based solutions, however, is principally dependent on the capabilities of the GPS-based solution.

6. The United States Department of Defense developed GPS (officially named NAVSTAR GPS), which utilizes a constellation of at least 24 Space Vehicles ("SV") broadcasting precise microwave signals to facilitate location finding for terrestrial observers. To estimate a terrestrial location, a device, such as a wireless handset, must: 1) be capable of receiving a very low power, spread

[1] http://www.cdmatech.com/products/gpsone.jsp

spectrum signal from at least three SVs[2] and 2) have precise knowledge of the SV positions (ephemeris) at the time of signal transmission. The acquisition of SV transmissions and tracking of ephemeris information are fundamental requirements of GPS that will limit the speed at which a position estimate can be achieved in certain environments. A typical GPS-equipped handset unit can take up to 12.5 minutes to acquire timing information, an almanac[3] and an ephemeris from the Navigation Message transmitted by GPS SVs. By contrast, the server-based GPS approach deployed by Verizon Wireless uses a coarse position estimate of the E9-1-1 handset (generated by the network) to provide both an almanac and ephemeris information so that fine GPS position estimates can be achieved in less than 10 seconds in many cases.

7. Critically, however, this GPS signal acquisition process can be hindered by the environment of the receiver. Specifically, environments containing obstructions (such as tall building, layers of construction materials inside buildings, and dense forest) are challenging environments for SV signal acquisition and can: 1) attenuate the SV microwave timing signals or 2) obstruct line-of sight visibility to the SVs in the surrounding environment. In either case, the result will be a significantly delayed (if not altogether prevented) GPS position estimate with the possibility of diminished accuracy. If SV signal acquisition is delayed, GPS receivers will require extended time to produce an accurate location estimate, if at all, in a challenging environment. For example, there may be insufficient SV

---

[2] Only three SVs are necessary for accurate location information when the network is used as a local timing source, as is the case for Verizon Wireless; When four or more SVs are available, no network timing assistance is needed to produce accurate location information.

[3] The GPS almanac is a set of data to describe the orbits of the complete active fleet of SVs which assists in the resolution of ephemeris.

signal acquisition time to produce an accurate location fix within the 30 seconds suggested by OET Bulletin 71[4] (and relied upon by public safety) to complete the entire process of both producing a fix and passing it downstream to the PSAPs. This interplay between timing and the surrounding environment is not easily resolved given the need for quick location fixes to provide to the PSAPs – despite the assistance of a server. In addition, a challenging environment may also prevent signal acquisition altogether from at least three SVs necessary for an accurate fix within the FCC's requirements. As explained in Verizon Wireless's comments at pages 17-18 and 20, the surrounding environment directly impacts the potential accuracy of the system, and renders the proposed mandate technically infeasible for some challenging environments.

8. Concentrations of challenging propagation environments within some PSAP boundaries will cause GPS estimates to require longer acquisition times than allotted for the delivery of a first fix at a rate of greater than 5% and may result in no GPS fix at all. This, in turn, will result, at a minimum, in non-compliance with the existing 95%/150 meters accuracy requirement of the FCC's rules.

9. Inaccuracies in the initial coarse location estimate result in larger search windows (both in space and time) for SV signals in the handset and can delay the GPS acquisition time, resulting in a delayed GPS fix. If the fix window is exceeded, the coarse location estimate generated by the TDOA network-based solutions employed by Verizon Wireless is delivered to the PSAP as a first fix and the resulting GPS fix is staged for delivery when a REBID process is executed by the PSAP operator. Many PSAP boundaries contain a very limited number of cell

[4] OET Bulletin 71 at 4.

sites (that are sufficient for voice calling), reducing the accuracy of the hybrid, AFLT, or other network-based location solutions utilized by Verizon Wireless. Commonly employed testing and analysis used in the industry consistent with OET Bulletin 71, however, only allow the first fix results delivered within the allotted 30 second window to be used to measure accuracy during testing.

IV. The Test Burden Created By A PSAP Level Compliance Rule Will Adversely Impact Accuracy Compliance Over Time

10. Effective evaluation of the 95% accuracy result with the 90% confidence level specified by OET Bulletin 71[5] can require hundreds of observations. While test call collection will propose a logistical challenge for Verizon Wireless, the greater challenge is the impact on system accuracy performance over time given the sheer volume of test calls required to meet the 95% accuracy metric at a 90% confidence level. For example, if 600 or more accuracy observations are needed to ensure statistical validity of test results within each of over 2800 PSAP boundaries deployed by Verizon Wireless today (with a potential universe of many more Phase II PSAPs), the test call volume to support the stated metric would represent nearly 1 month of live E9-1-1 live emergency calls.[6] The impact of this volume of testing will tax the deployed system and adversely impact its performance over time -- further impeding carriers' ability to comply with the accuracy mandate, not to mention performance when it is really needed to locate

---

[5] OET Bulletin 71 at 7.

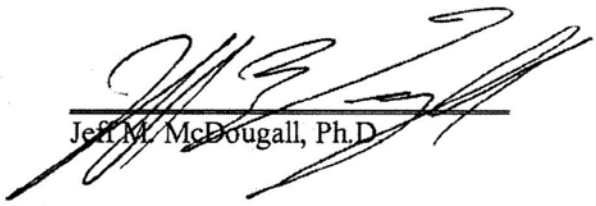
[6] The statistical formula in OET Bulletin 71 may require more than 600 test calls in some PSAPs. OET Bulletin 71 at 11. While non-binding, the PSAPs and the industry have relied upon the Bulletin in shaping the current testing methods and procedures and to produce valid test results.

an emergency caller. Over time, the technical feasibility of achieving PSAP-level accuracy may actually decline, not improve.

V. Conclusion

11. In sum, based upon my knowledge of the E9-1-1 Phase II systems deployed by Verizon Wireless, I conclude that it is not technically feasible for Verizon Wireless's network to comply with the Commission's existing accuracy requirements for Phase II E9-1-1 location at all test areas defined by PSAP boundaries.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.



Jeff M. McDougall, Ph.D.

Executed: August 30, 2007